THE OPTICAL
MAGIC LANTERN
JOURNAL
AND
PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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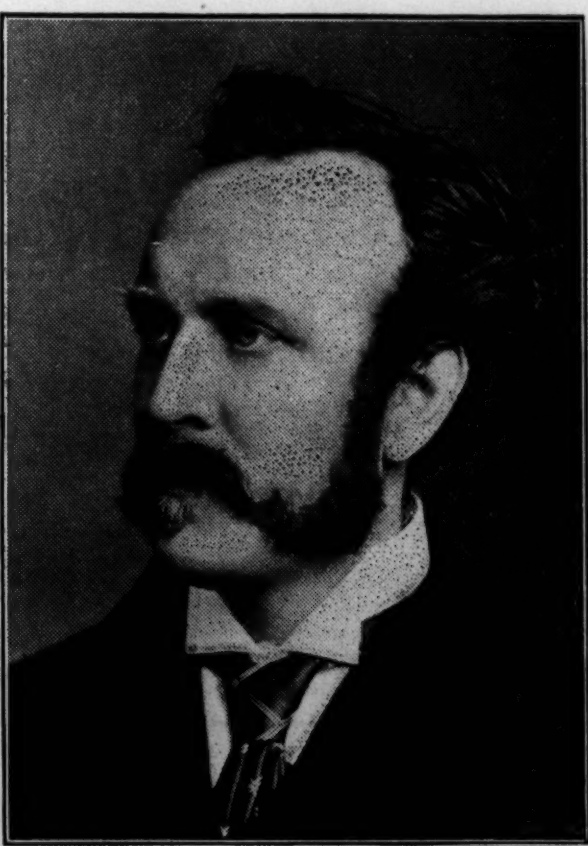
Best Wishes for the . . . .

. . . . . . New Year, from



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Yours fraternally,

J. Hay Taylor.

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Notes.

About a fortnight ago, a bazaar and sale of work was held at Broad Street Baptist Chapel, Ross, Hereford, in aid of purchasing a magic lantern for the use of the Pastor in church work. Many of the ladies connected with the church furnished well-laden stalls, and during the evening a concert was given.

* * *

The electric current has now been laid on at Mr. J. H. Steward's, 406, Strand. We recently there saw the new lantern for stereoscopic projection fitted with the Davenport electric lamp—the effect is grand.

On page 202 of last issue, when speaking of the old Royal Polytechnic, we alluded to Mr. Edmund H. Wilkie as having been one of the Directors. Our attention has been directed by Mr. Wilkie to this error. On further investigation we find that, although eligible for the position, Mr. Wilkie did not on any occasion serve on the board. We gladly make the correction.

Mr. Horace Banks is a rising man. Last season he filled nearly a hundred engagements throughout the country, and for this season he has a great many engagements ahead for his dioramic lecture "Picturesque New Zealand."

* * *

Those requiring castings of any kind in connection with the optical or lantern line, are directed to the fact that Messrs. Broad & Son, of Windmill Street, Tottenham Court Road, N.W., and Uxbridge Road, W., make a special feature of this department. Size is no object with Messrs. Broad, as they cast all the way from the small portions of limelight jets, and microscopes to the huge fountain that stands in Shaftesbury Circus, W.

* * *

A microscope made over a hundred years ago, was lately exhibited at the Liverpool Royal Institution by Mr. William Slater, who explained its parts in an interesting manner to the members.

* * *

It is not many years ago that people in the North of Scotland uttered strong objections to the use of a modest organ in their churches; what they would say could they rise from their graves, and witness a lantern show in the very same church that they attended is easier understood than expressed. Yet such has been the march of progress, that even in the far north we learn that it is not uncommon to have a lantern in the church on week-days. From a week-day to Sunday itself is but one step, and we doubt not that that step will become a common one in a very short time.

* * *

The inventor of the lantern for the projection of opaque objects, the great mathematician Euler, had a sceptical mind, and it was several years before he would believe in the manufacture of achromatic lenses by Mr. Dollond. Nevertheless, several telescopes made with achromatic lenses were made and put into use, and Euler ascribed their good qualities to the cleverness of Mr. Dollond in calculating the curves of the lenses. Euler's opinion was that different kinds of glass differ but little in their dispersive power, and it was not until 1764 that evidence reached him that by means of the introduction of lead, glass had been made with four times the ordinary dispersive power. He then withdrew the weight of his authority in opposition to Dollond's invention, the merit of which then became firmly established. Before these events, Dollond, in 1752, had contributed a short paper to the Royal Society, arguing that Euler was all in the wrong about the principle of a water-lens which the latter had designed.

The Kenetoscope, (Edison) and Photoramic Effects (Green).

An instrument termed the Kenetoscope has recently been placed on public exhibition in London. With it, photographs of moving objects can be viewed, as it were, in motion. Several exposures of say a person dancing are made per second, and from these negatives, transparencies are printed on a long strip of celluloid. Each picture, like the old wheel of life, differs slightly from one another, and, as in the process of raising one's arm, each picture shows it as being a little higher than the preceding one. When this strip of pictures is passed rapidly in front of the eye with a slotted disc moving in the contrary direction, the blending of the pictures is such, that the figures depicted have every appearance of moving. In fact when looking at the combination it is a somewhat difficult matter to realise that one is not looking at the scene itself, so real is the effect. We were informed by the firm who are introducing this instrument in this country, that the idea was conceived by Mr. Edison some *four years ago*, and it is put forth as "Edison's latest and greatest invention, the Kenetoscope." It is quite possible that Mr. Edison has worked this out for himself as said, within the last four years, but the fact remains that we published in this Journal for November 15th, 1889 (at which time this Journal was published on the 15th instead of the first of every month as now), more than five years ago, an account of a similar effect produced by Mr. Frieze Green, a prominent photographer of London; and in the majority of the London daily papers of that date, extracts from our article appeared, either in the form of sub-leaders or paragraphs. In fact, the *Daily News*, if we mistake not, went so far as saying: "Unless the editor of the Optical Magic Lantern Journal is the dupe of his imagination, we shall shortly expect to see . . ." Then followed a portion of our article, which article we here reproduce :—

A Startling Optical Novelty.

PHOTORAMIC AND PHONO-PHOTORAMIC EFFECTS.

It would doubtless seem strange if upon a screen a portrait (head) of a person were projected, and this picture slowly became of an animated character, opened its mouth, and began to talk, accompanied by an ever-changing countenance, including the formation of the mouth as each peculiar sound is uttered; or if, instead of one head, two were produced, and an argument gone through with all the turns and twists of the head incidental to such.

It would also appear curious to have a street scene depicted on the screen, and for the spectators to witness the various horses and vehicles running past in all directions,—persons walking to and fro, and dogs running along, all at varying speeds and with life-like motion, and not go past in a gliding manner—all this, not as silhouettes, but with all detail.

Strange as all this may seem, it is now an accomplished fact, and the optical lantern will shortly be considered a *sine qua non* as a recording instrument.

Imagine the sensation that would be produced if the whole of the recent Lord Mayor's Show were to be presented upon a screen exactly as seen by a person stationed at one particular point looking across the street. The houses on the opposite side would remain stationary, and the procession would pass along, each minute movement, as it actually took place at this given point, being represented.

The name of Frieze Greene, the eminent photographer, of Brook-street, W., will become familiar throughout the land in connection with an invention by which all these effects can be produced. He has invented a peculiar kind of camera—to outward appearance, not unlike an American organette—handle and all—about one foot square.

This instrument is pointed at a particular moving object, and by turning the handle, several photographs are taken each second. These are converted into transparencies, and placed in succession upon a long strip, which is wound on rollers and passed through a lantern of peculiar construction (also the invention of Mr. F. Green), and by its agency projected upon the screen.

When the reproduction of speech is also desired, this instrument is used in conjunction with the phonograph.

In our issue for April 1st, 1890, we gave an account of the photoramic camera, by which several exposures were made per second, and at the same time gave two illustrations of the apparatus.

—:o:—

*Modern Optical Illusions.—No. V.

By Edmund H. Wilkie,
Of the late Royal Polytechnic Institution.

(*Continued from p.* 208.)

Last month we left the young lady in our illusion smiling a contented smile, as who would not, under similar circumstances, being quite free from most of "the ills the flesh is heir to" on account of a total absence of body. To prove to us that we could really see to the back of this small apartment, the exhibitor explained that he would go to the back, and, opening a panel, look through at us.

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In the illustration an inner line will be noticed round the back wall. This is a removable panel, and when taken out of its place, we could see right through to where the showman bowed, the head still being apparently disconnected from any possible body. After having read the description of "The Delphic Oracle," it will at once occur to our minds that this illusion is worked in the same manner, by means of the mirror inclining towards the back, and with a hole through the centre. The brass rods are really only halves, being flat on one side from end to end, and would exhibit a semi-circular section. Being fixed on to the surface of the reflecting glass, they appear as whole rods, and this will at once explain why they are placed at the particular angle they occupy.

But now comes the question—How does the exhibitor show himself through from the back? He cannot be solid; we must be looking at a reflection, as we know that he could not be seen through the mirror.

Where is he reflected from? Only one place is possible, and that is the top. This suggestion, however, does not lead us much further, for on consideration we find that if he removed a panel in the top of the chamber, and bent over to show himself, his image would be reversed, and would then appear head downwards.

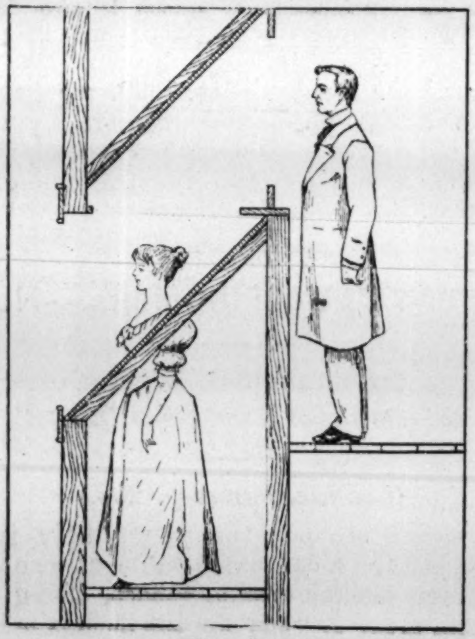


Fig. XV.

The difficulty is overcome in the manner shown in the sectional view (Fig. XV.), where we see the remainder of the young lady's body hidden behind the sloping reflector, as in the last illusion. The mirror which conceals her body has its reflecting surface upwards, and above it a panel in the top, which, when reflected, appears as the one in the back of our front view of this illusion. Above this panel, which is removed in our sectional view, is another mirror with its reflecting surface downwards, and facing that at "the mystic angle" we find another panel in a vertical position.

It will be seen that if this middle panel is closed its reflection will be received in the lower mirror, and will appear as the back of the small chamber in which the living head appears to be suspended. When the operator has taken his position at the rear, as we see him in the illustration, the panel is removed, and we think we see him, but owing to his image being reflected twice, he appears standing a little way back from the open panel behind the lady's head.

The illusions I have treated upon so far have been accomplished, in the first instance, by simple light and shade, then by reflection from sheets of plain glass, then levitation by sliding plates of transparent glass, and recently by means of plain mirrors placed at an angle; so we will now take a step further, and consider a few effects, the result of plain mirrors placed at an angle and acting in concert with each other.

It might be urged that the last illusion we described would come under that heading, but that is not so, as it was perfect in itself without the aid of the second reflector for producing the image of the assistant. Many scientific toys have been formed by the use of two pieces of looking glass, as, for instance, "The Kaleidoscope," and Professor Wheatstone's "Reflecting Stereoscope," which has no lenses, but owes its properties solely to two pieces of silvered glass.

Some time back I and others were attracted by a crowd at a street corner, and on pressing forward to see what was the matter, were amused to find that an ingenious mechanic out of work had constructed an instrument which enabled the observer to look straight through a brick.

Now this is not very new, and no doubt many of the readers of this Journal will recognise the apparatus at once, but for the benefit of the few who possibly are not acquainted with it, we will ask them to bear with us for a few moments.

In outward form it resembled Fig. XVI., and on looking in at (A) through what appeared to be a powerful eye-piece, the spectator was able to see objects on the other side of the street, in spite of the fact that a brick was intervening in the centre of the apparatus. The body of this elaborate machine was mainly composed of three cigar boxes, with pieces of brass tube let in at each end. The "lenses" in the ends of these tubes were composed of circles of plain window glass, and the scheme of the whole illusion will be seen on reference to the diagram, the double dotted lines shewing the position of the mirrors, and the single dotted line is the line of reflection. The whole instrument reminded us very forcibly of the "patent double-million magnifyin' gas microscopes of hextra power" spoken of by Samuel Weller in the trial scene in Charles Dickens' "Pickwick Papers," and by the aid of which he considered he would be able to see through a brick wall.

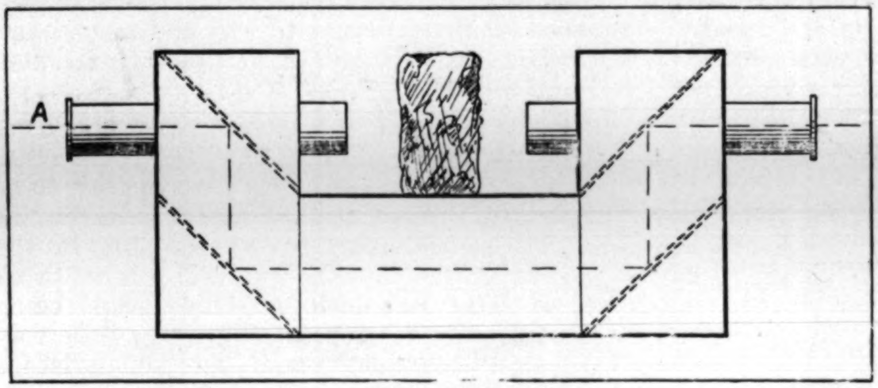
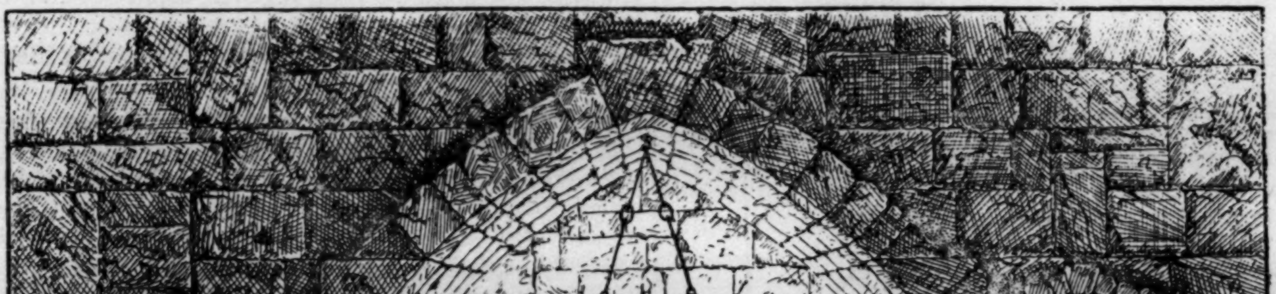


Fig. XVI.

Amongst the most striking illusions brought before the public during the connection of Mr. Thomas Tobin with Professor Pepper at the Royal Polytechnic, was a striking if rather ghastly effect entitled, "The Head of the Decapitated speaking." Although horrible in appearance it caused much wonder and entertainment amongst the large crowds of people who flocked to see it every afternoon and evening, many of whom having paid a shilling to get in would have gladly given two to get out again, when the curtain was raised.

It was the custom to preface these illusions with a short lecture on illusory subjects just to



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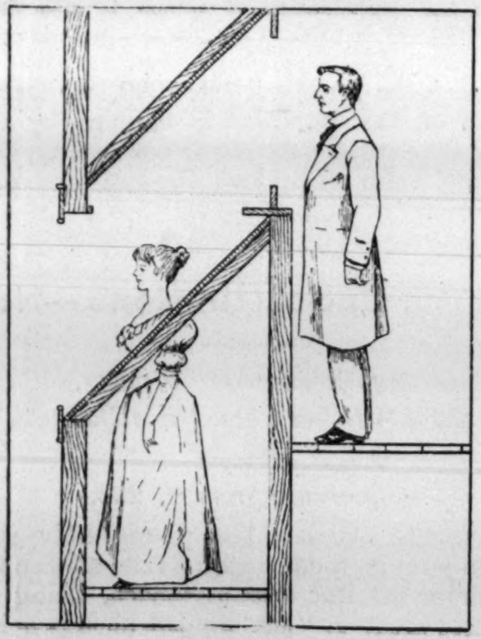

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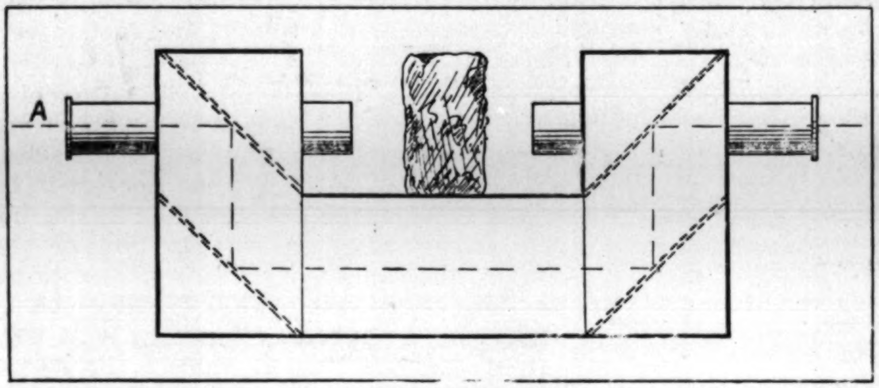

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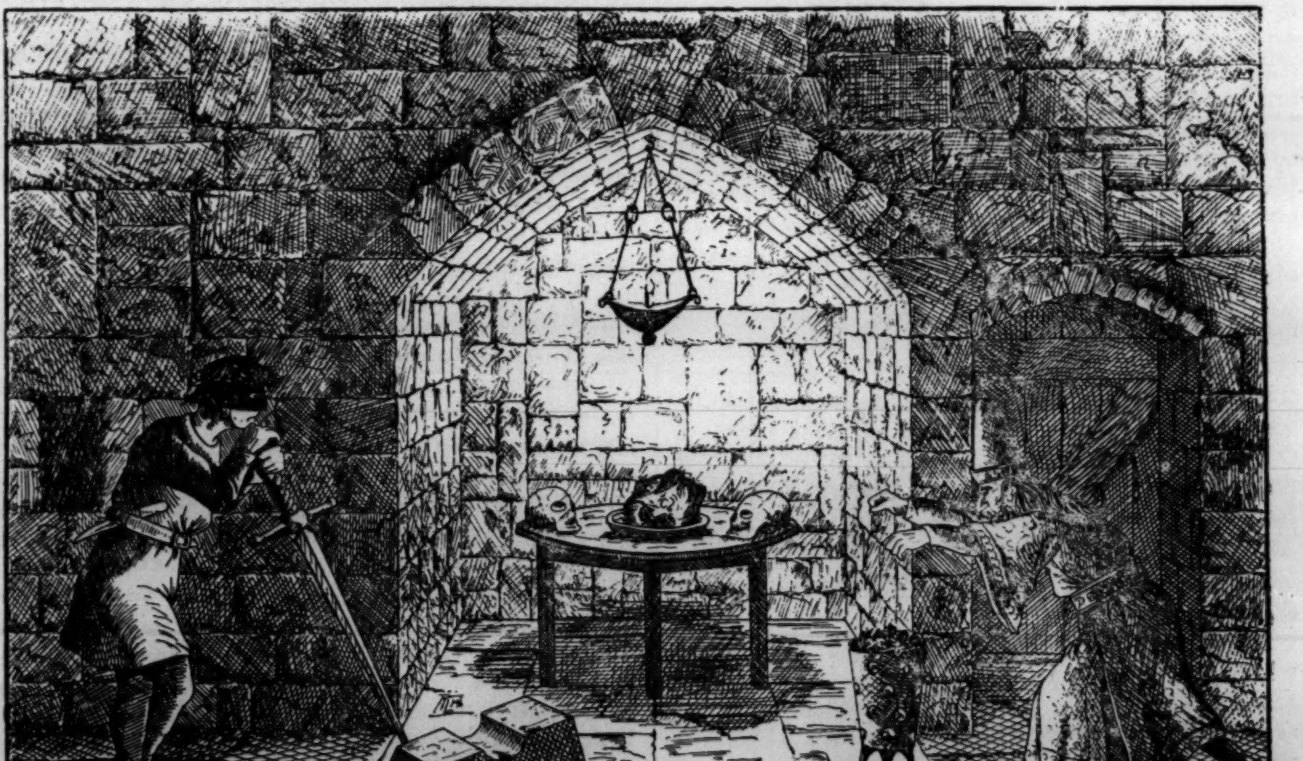


Fig. XVII.

fill in time, as none of these effects occupied long in actual exhibition. In this case the story which introduced the effect preluded the disclosure of the scene, and although I cannot vouch for the correctness of the words I shall presently give you, after the lapse of so many years, will tell you the tale in my own way.

"Some time in the middle ages, a conveniently vague date, there lived somewhere or other (we are very distressed but really cannot give more definite particulars) a magician, not a parlour magician who burns handkerchiefs and restores them charmingly scented immediately afterwards, but a regular right down genuine magician, who was generally credited by the surrounding nobility, gentry and general inhabitants with the possession of knowledge greatly in advance of his contemporaries, and as one's neighbours generally know more about one's affairs than one's self, it naturally follows that they must have been correct.

He held communion with the stars, not the "Three Stars" we mostly find in connection with the names of Hennessy and Martell, but the glittering orbs of night as they shone forth in radiant beauty through the soft eastern air. By constant study he had mastered some of the innermost secrets of Nature, the learning of the ancient Chaldees has descended to him, and as he sat on his solitary tower night after night he conversed with "The Great Bear" in the most familiar manner. Let us drop the curtain before him, and "ring up" on another scene—An Italian Palace, night. Through the large arches of a portico, partially hidden by heavy silken curtains, a magnificent garden is seen brilliantly illuminated by the moon's pale beams, the air is heavy with perfumes emanating from a large chased silver lamp, which hangs suspended by chains from the painted ceiling, and the silence is broken only by the plashing of the fountain without, and the hurried footsteps of a man within.

It is indeed a scene where all around is beautiful, and only man is vile; at least, this one was.

Those were the times when might was right, when the owner of each estate was entitled prince, and each prince exercised almost sovereign power. He had been prodigal of his wealth, and had brought himself to the verge of ruin; his days were miserable, and his nights sleepless. He reflected, he must do something —or somebody—it did not matter which, and it came into his mind that his nearest neighbour, Count Capo di Monti, a man of learning, who lived in seclusion, and was said to possess great wealth, was a suitable subject for the exercise of his talents. Accordingly, he engaged two unscrupulous men to kidnap the Count, and we first make his acquaintance, awaiting their return with their victim.

Soon footsteps were heard on the gravel. He advanced to the garden entrance, and sighed to the villains to take their burden to the extreme end of the building, where stood a ruined tower, under which was the old torture chamber.

After a short interval of agitated indecision he made his way in the same direction, where we shall follow him——in our next.

—:o:—

Who Introduced Photographic Magic Lantern Slides?

By S. G. S. Dicker.

The first of anything always has a peculiar interest and fascination. The first photographer, the first camera, the first magic lantern, the first dissolver, all have an especial interest, and to the readers of this journal especially, the first maker of photographic magic lantern slides is a person of some importance. Who was the first man to produce and use a photographic lantern slide? A claim has been put in by a member of the Philadelphia Photographic Society on behalf of Langenheim of that city about the year 1850. Now can this claim be substantiated, or can an earlier date of introduction be established? As regards the latter question I do not know of any prior claim, although there must be many still living who might be able to throw some light upon the subject of lantern slides prior to the Great Exhibition of 1851. Glass positives or transparencies must not be confused with photographic lantern slides; it is the application of glass positives to the magic—as it was then called—lantern that is in question. England's claim, in the person of Sir John Herschel, to the introduction of glass in the place of paper is generally admitted, but can we prove that an Englishman likewise was the first to apply a photographic positive on glass to the optical lantern?

Now as regards my first question. Can Langenheim's claim in 1850-1 be substantiated? I say at once that it can, though perhaps the *exact* date may be lost in the mists of 40 to 50 years ago. In the *Daguerreian Journal* for the 15th April, 1851, there appeared an article (taken presumably from the *London Art Journal*) by Robert Hunt on recent photographic improvements, in which he spoke in glowing terms of the new Hyalotypes or positive pictures on glass, the invention of Messrs. W. & F. Langenheim, of Philadelphia, United States, the proprietors of Fox Talbot's United States Patents. The inventor stated that the distinguishing feature consisted in the material on which the impressions were taken. They said "we have substituted plate-glass for paper in the negative and also in the positive."—"The most interesting application of this discovery," said Mr. Hunt, "is the construction of *magic lantern slides taken from nature by the camera obscura without the aid of the pencil or brush.*" In introducing these new slides Messrs. Langenheim said: "The new magic lantern pictures on glass must throw the old style of magic lantern pictures into the shade, and supersede them at once on account of the greater accuracy of the smallest details, which are drawn and fixed on the glass from nature by the camera obscura with a fidelity truly astonishing." Mr. Hunt, in commenting on these slides, said in the same issue: "We have now before us a series of these magic lantern slides—the Hyalotypes—and we feel bound to declare that their delicacy and the perfection of their details cannot be overstated. In a view of Spring Gardens Hall, Philadelphia, about three inches in diameter, the delineation of the details are marvellous. In another picture for the purpose of showing the facilities afforded by this process, a slight transparent tinting has been given to the trees, a neighbouring house, and the sky. Already these photographic artists have published one hundred and twenty-six views around Philadelphia, Washington and New York, and others are published in the same way"; and other interesting particulars are given by the writer.

Now Robert Hunt knew as much about photography and its applications as any man at that time, and his testimony is certainly of great weight; and if glass photographic lantern slides had been known in England at that time he would no doubt have heard of them.

In the Great International Exhibition which was opened in May, 1851, Messrs. Langenheim showed in the United States section some of their magic lantern slides, and the official catalogue contains the following remarks concerning them: "These slides are produced by the action of light alone on a prepared glass plate by means of the camera obscura, without the use of the brush, whereby the smallest details are accurately given and fixed on the glass from nature. This application of photography is a modification of the Talbotype process, with the substitution of plates of glass for receiving the positive images upon, in lieu of paper. The delicacy of the outlines, together with the accuracy of the detail of all photographic pictures, appears in great beauty when magnified as they are in the present instance of their application to the magic lantern." In the Juror's Report we find the following reference to Mr. Langenheim's exhibits: "This artist exhibits a series of subjects on glass, designated by him under the name of Hyalotypes, being delicate miniatures, excellently adapted for magic lantern subjects. The material would appear to be collodion, albumen, or some similar preparation, forming a film on the glass capable of receiving the impression."

I know that about the same time Messrs. Ross and Thomson produced some very beautiful Talbotype pictures on glass, but did they or others ever adapt photography to the production of lantern slides before 1850?

—:o:—

Slides for Science Teachers.

MAGNETIC CURVES.—No. II.

By E. D. Bartlett.

In my last article on this subject, I endeavoured to show how lantern slides of magnetic curves could be produced photographically. Students attending lectures are more influenced by seeing the curves actually produced in their presence. To do this it is necessary to resort to other means than those previously mentioned.

The late Professor Tyndall, whilst delivering a course of lectures on light, in America, during the years 1872-73, used the following means to exhibit to a large audience "The Phenomena of Magnetic Curves"; and in speaking about them he said:—"The aspect of these curves so fascinated Faraday, that the greater portion of his intellectual life was devoted to pondering over them."

The method used by Professor Tyndall for showing these curves was by means of the vertical attachment. A diagramatic view of the apparatus is shown in Fig. I. A thin sheet of glass (L) is first placed on the horizontal condensing lens, so as to prevent the filings from scratching it. The magnet (M) is then placed upon this piece of glass, and upon the magnet is placed another piece of thin glass (N), which is then dusted with iron filings and focussed upon the screen. By gently tapping the glass (N) the friction between the filings and the glass is neutralized, and the particles are thus enabled to assume the position they would occupy if perfectly free to move. Time may be saved by cementing the magnet to the glass (N); otherwise the glass is liable to shift and spoil the experiment.

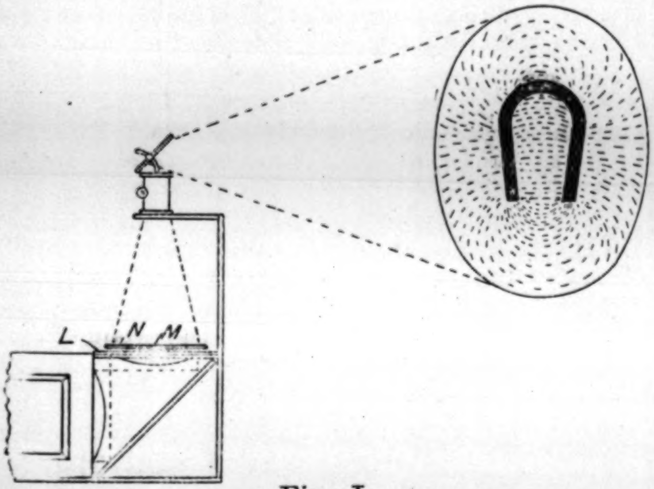


Fig. I.

Another method by which the vertical attachment is dispensed with, consists in simply dipping the magnet into a heap of iron filings supported and placed on a table immediately in front of the condenser of the lantern. This simple means partly shows the phenomena and is generally used, but does not give the best effect obtainable, the filings forming themselves in a mass at the poles of the magnet and not showing the curves. To overcome this, Mr. Hopkins, of New York, placed the iron filings in a glass tank filled with glycerine, and then placed the magnet in it. Take some iron filings and put them into a bottle which is nearly filled with pure glycerine; some small pieces of wood are made into the shape shown in Fig. II. On the top cross piece of wood, put a screw or nail in the centre, so as to allow a horse-shoe magnet to be suspended upon it. Now place a small glass tank (A) upon the base of the wooden support (J), and nearly fill it with the mixture of iron filings and glycerine, well shaking the bottle first. When the magnet, which is in this case a horse-shoe magnet, is suspended upon the screw (C), and having its poles dipping into the solution in the tank, the filings soon arrange themselves and form the magnetic curves about the poles of the magnet.

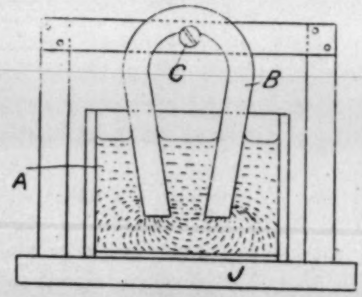


Fig. II.

The same effect, but more pronounced, can be obtained by substituting electro-magnets in the place of the simple horse-shoe magnet. Smaller and more powerful magnets can be obtained by this means. Fig. III. shows a piece of apparatus for projecting the magnetic curves by the aid of two electro-magnets. A flat piece of wood (J) is provided with two uprights (KK), which have a peg (HH) at their upper ends. These pins pass through holes in the cross-bar (E), which carries the two soft iron rods (FF). The rods (FF) are surrounded by two bobbins (GG). To exhibit the curves, remove the cross-bar (E), with its adjacent parts, and fill the tank (A) with the mixture of iron filings and glycerine from the bottle, shaking it well. Replace the cross-bar, connect up to the battery, and the magnetic curves will soon make their appearance. A variety of effects can be produced by connecting the wire bobbins (GG) separately, and also varying the direction of the current. In the last two experiments it will be advisable to use an erecting prism, otherwise the apparatus is shown upon the screen inverted. Those teachers who have not as yet tried this method of exhibiting the phenomena of magnetic curves will find the effect obtained better than that by the older method.

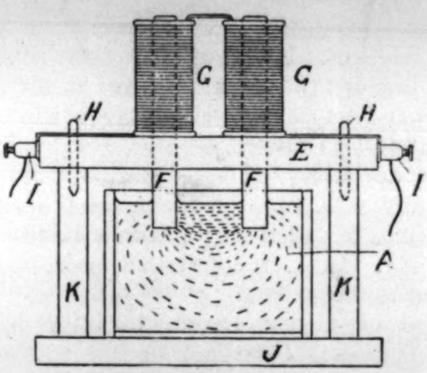


Fig. III.

Another simple arrangement for the lantern, connected with magnetism, consists of a short glass tube provided with clear glass ends, and filled with a mixture of fine particles of magnetic oxide of iron and water. Shake up the mixture, and place the tube so as to project a beam of light through it. The light will be found to only partially penetrate the mixture. Place the glass tube in a coil of wire, and pass an electric current through the wire. Having done so, place the tube in the path of the beam of light, and it will more readily allow the light to pass through. This is because the particles of iron oxide arrange themselves longitudinally, and, therefore, offer less obstruction to the rays of light.

Tips for Lanternists.—No. IV.

By Saturator.

The next form of light we will consider is that obtained from the saturator. As all lanternists know, this is done by passing a stream of oxygen through ether or a volatile fluid or over ether vapour, and using the mixture therefrom as hydrogen or coal gas on the one hand, and mixing pure oxygen from the opposite side in the chamber and burning both at one nipple.

It is stated in most of the books upon lantern apparatus that this form of light is highly dangerous, and should be shunned; in fact, one is almost led to believe that it would be preferable to put up with the light from a "humble tallow dip" rather than run the enormous risk attending the use of a saturator.

It is really amusing to hear some people talk of saturators. They have a vague idea that ether or benzoline contains some latent infernal propensities which may be developed at any moment without the least apparent cause, whereas if a little judgment were brought to bear upon the subject, it would at once be discerned wherein the true danger, if any, existed. I advisedly say "if any danger existed," as with the old form of saturator there was a danger, but with the new form there is none.

Even people who are generally considered well informed upon most subjects appear to have very vague ideas upon this particular one, and vote it a means of illumination to be despised wherever anything else is at hand; but for all that, the saturator in its newest forms bids fair to supersede all other means of illumination for the lantern, especially in country districts where coal gas is not obtainable, and justly too. It is quite as easy if not easier to manage than the ordinary jet, and the light is certainly far more brilliant.

What is the use of crying down an evil unless we have something else which can be used in its stead, or point out wherein the evil exists and a means of eliminating it. So far as one can gather this has not been done. "The thing is dangerous, that is all I know and care, so there is an end of it;" this appears to be the sum total of their reasoning. So is a gun dangerous, a bicycle too, and in fact most other things if not properly constructed, but it does not prevent their being used.

I am afraid my readers will think I am wandering away from the question, so I will endeavour to describe the several forms of saturators, and some of their peculiarities.

One of the first forms of saturators used was, I believe, the Broughton tank (Fig. I.). This was a copper vessel about 12 × 6 × 2½ inches, which had a series of shelves running its length in horizontal position; these were soldered to the sides so as to compel the oxygen to travel backwards and forwards gathering the vapour. Then Mr. Broughton along with Mr. Hardwick invented a tank fitted with perpendicular partitions reaching nearly from the top to the bottom, these being alternately soldered to the top and bottom of the case as in Fig. II.

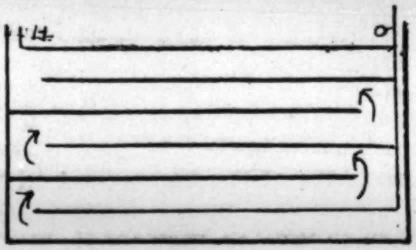


Fig. I.

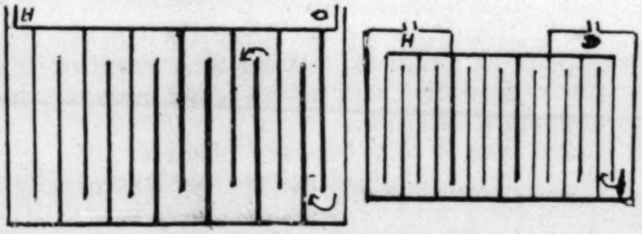


Fig. II.

In both these the ether was poured into the case until it was nearly full, and the oxygen was led through the compartments in a sinuous course and was saturated.

Neither of the above saturators were packed with stuffing or absorbent material. The chief faults in these two forms were: firstly, in their not being packed:—When full of ether they were safe in experienced hands, but as the fluid became exhausted, so its place was being filled by oxygen, the saturation of the oxygen became less perfect, and instead of the point of ignition being at the nipple of the jet, it was first drawn back into the chamber, then along the pipe, and finally into the tank. Secondly:—Sometimes it happened that the solder joints were not always perfect, and instead of the oxygen passing through the fluid it gradually crept through the cracks, and gave an excess of oxygen on the other side, which would cause the flame to fly back into the tank. It was not always possible to discover these flaws in a new tank, as at first they might be very minute, and only become developed after use by the erosive action of the oxygen upon them.

There was also another danger attached to this form of saturator, *i.e.*, should the tank from some cause or other become tilted, and the liquid get into the india-rubber pipe connecting oxygen bag with same, there was an explosive mixture generated.

The over-supply of oxygen, as I will term it, occurs much sooner when a saturator is used cold, than when it is warmed, because as the ether or benzoline is vaporised its temperature is reduced, and a variety of means were devised for the warming of the instrument while in use.

This reminds me. Many lanternists, ignorant of saturation matters (I mean ether), are under the impression that it is the ether or benzoline which is so explosive, and consequently have a tendency to under-fill their apparatus, whereas, as will be observed from the foregoing, it is just the reverse.

If a saturator is overfilled, when the oxygen is turned on it forces out the surplus ether, and of course would flare up, which is perhaps a little unpleasant, but that is all; but when under-charged we have the flame brought back into the instrument to a point where there is sufficient vapour to ignite, and there is a small or loud report according to whether it is a large or small amount of mixture.

The moral therefore is: Always have your saturator well charged at the start, and never run it until dry if you can possibly help it.

In the large double-barrelled instrument we have another kind of risk, that is, over-supply of gas. This class of saturator holds perhaps a pint or pint-and-a-half of ether, and when in use if too much oxygen is allowed into the instrument gas is generated faster than used, and of course accumulates inside the apparatus and blows off the ends or rips open the barrels.

Again, in all the forms at present mentioned it is usual to connect them to the jet by lengths of india-rubber tubing, and to keep up the light all this tube has to be charged with gas, composed of a mixture of etherised oxygen, which really amounts to a considerable quantity; and so soon as the ether begins to fail in the saturator, and the oxygen is in excess, instead of the point of ignition being at the nipple, it is suddenly drawn into the chamber, and then into the tubing, and finally into the saturator itself.

It should be borne in mind that it is not entirely the pressure at the back of the light which keeps it burning at the nipple, but the correct proportion of the two gases, and so soon as the ether fails, and the pressure of oxygen is increased, so the point of ignition is drawn backwards, and no doubt this has been the cause of a good many explosions from time to time.

A Ghostly Episode.

By S. Wellwood.

Not long ago, my duties as lantern operator to a popular lecturer took me to a small town in the North of England, which had formerly been of considerable historical importance, but whose chief interest is now to the archæologist and the student of history.

Our lecture was to commence at eight o'clock, but I arrived at the fine old church where it was to be delivered, about six, as I wanted plenty of time to fix the screen and make all ready, and afterwards to get something to eat. I was admitted by the pew-cleaner, with instructions to simply close the door when I left, as it would not be worth while locking it till the lecture commenced.

Having completed my preparations a little earlier than I expected, I had some time left to examine the monuments and quaint sculpturing which abounded. The floor was of stone, as almost everything else was, and the sound of my footsteps seemed to fill the edifice, being loudly echoed by the parabolic curves of the roof. The monuments were very interesting; an interest, however, of a melancholy kind, as they silently told the observer of men who had distinguished themselves in the progress of nations. After a general survey of these interesting objects I lowered the lights preparatory to departing, and had nearly shut the door, when I remembered that I had better light the hydrogen side of my jet, to warm up the lime. I did so, and was again proceeding towards the door, when I heard a sound of laughter coming from the vaults beneath; laughter of a horrible kind. I hastily turned up some of the gas jets, obeying the instinct that light banishes fear, and waited with trepidation for further developments; but I had no time to think over the occurrence, for the laughter again sounded distinctly, but this time some distance from the former place. Being now thoroughly frightened, I tremblingly made for the door, but was arrested by a horrible gurgling sound directly below my feet, followed by a deep sigh, then a noise as of one falling heavily on a stone floor.

Almost out of my senses I rushed to the door and grasped the handle, but to my horror found that I was *locked in*. I sat down in a pew and wiped the cold sweat from my face. The deathly silence which now reigned, and which I momentarily expected to be broken by some ghostly sound, still further added to my fear. I tried to persuade myself that the whole thing was a trick of the mind after thinking on the departed heroes who slept underneath, but the evidence of my senses, and the fact of the door being locked, only too forcibly shewed that the strange mystery, whatever it was, was certainly real.

The only thing now left to do was to cross the church and try the door which led out through the vestry, though there was small hope in that; but I was doubtful if I had the courage to pass the spot at which I had last heard the sounds. The silence, at first terrifying, but gradually reassuring, at length led me to screw up my courage, only to find that this way of escape was also denied me; but, to my infinite relief, the pew-cleaner unlocked the front door and entered. I immediately asked her if she knew how the door came to be locked. She replied that on passing she had found the church dark, and the door ajar, and thinking I had gone off, forgetting to close it, she had done so, but thinking better of it, had locked it, and was now back for the lecture; this, then, was the explanation of the door mystery. I then asked her if she had ever heard sounds of a ghostly nature proceeding from the vaults, but this idea she scouted.

The audience now began to flock in, and I resolved not to mention to anyone what I had heard. The lecturer arrived and after the usual preliminaries started his subject, which was, "The Picturesque Ruins of England."

He was in fine form and everything went beautifully, till he delivered himself of the following:—

"In conclusion, ladies and gentlemen, I think you will all agree with me that these old ruins of former greatness, are a never failing source of interest; with their moated granges, decrepit and trembling arches, sombre corridors, blackened towers and subterranean passages and dungeons, from the damp and fungus-laden atmosphere of which arise ghostly visitors" —when, to the terror of the assembly, a form rose from a trap-door in front of the lantern, causing a huge shadow picture on the screen, with a bottle projecting from one of the pockets.

It was the sexton.

He had got drunk and had gone into the vaults for some purpose, and having slept it off, promptly left the scene of his spirituous, but to me spiritual, manifestations.

The Supply of Oxygen to Lantern Flames.—No. V.

By W. H. Harrison.

(*Continued from p.* 195.)

Somewhat similar to the obtaining of oxygen from common air by allowing it to dissolve in india-rubber, and to evaporate on the other side, is the principle of allowing air to dissolve in water and then to extract the same. In both cases the oxygen of the air is dissolved more freely than is the nitrogen.

In the year 1869, on July 15th, a remarkable English patent, No. 2137, was taken out by Jules Theodore Anatole Mallet, a Parisian engineer, for obtaining oxygen almost free from nitrogen, from common air, by taking advantage of the different solubilities of oxygen and nitrogen in water. Water absorbs forty-six thousandths of its volume of oxygen, and twenty-five thousandths only of nitrogen. When the two gases are mixed in the first instance, the proportions in which they are mixed will influence the respective quantities dissolved. When common air is dissolved in pure water, it exists therein in the proportion of 33 per cent. oxygen and 67 per cent. nitrogen.

Mallet's plan was to dissolve air in water, then to pump it out again with its richer proportion of oxygen, and to force this enriched air again into water, whereby more nitrogen is rejected, and so on in succession to any desirable extent.

With each solution the increase of the proportion of oxygen is as follows:—

Atmospheric Air ..	Nitrogen ..	79	per cent.
	Oxygen ..	21	,,
1st Solution ..	Nitrogen ..	67	,,
	Oxygen ..	33	,,
2nd Solution ..	Nitrogen ..	52·5	,,
	Oxygen ..	47·5	,,
3rd Solution ..	Nitrogen ..	37·5	,,
	Oxygen ..	62·5	,,
4th Solution ..	Nitrogen ..	25	,,
	Oxygen ..	75	,,
5th Solution ..	Nitrogen ..	15	,,
	Oxygen ..	85	,,
6th Solution ..	Nitrogen ..	09	,,
	Oxygen ..	91	,,
7th Solution ..	Nitrogen ..	05	,,
	Oxygen ..	95	,,
8th Solution ..	Nitrogen ..	02·7	,,
	Oxygen ..	97·3	,,

Thus by the use of materials which cost practically nothing, he obtained a mixture of 97·3 per cent. oxygen and 2·7 per cent. nitrogen. The cost, of course, came in over such items as machinery, fuel, and wear and tear. Drawings of the machine used are given in the patent; the machine is not complicated, and has but three compressing vessels, or receivers. The machine yielded air containing 62 per cent. oxygen with an effective pressure of five atmospheres. The first receiver had a capacity of about ten cubic yards; the second seven, and the third receiver five cubic yards; with these dimensions he obtained 78 per cent. of gas after each operation. For detailed information about the machinery the patent should be consulted.

Mallet tried experiments, for scientific information, on the use of alcohol instead of water as the solvent of the air, with the following results:—

Atmospheric Air	..	Nitrogen	..	79	per cent.
		Oxygen	..	21	,,
1st Solution	..	Nitrogen	..	62	,,
		Oxygen	..	38	,,
2nd Solution	..	Nitrogen	..	41	,,
		Oxygen	..	58	,,
3rd Solution	..	Nitrogen	..	23	,,
		Oxygen	..	76	,,
4th Solution	..	Nitrogen	..	12	,,
		Oxygen	..	88	,,

So far as I can see, Mallet's plan of obtaining oxygen from the air is impracticable on a small scale at home, because of the cost and bulk of the apparatus necessary, and it does not seem likely at present that the same result can be obtained in a simpler way.

Another plan, somewhat resembling the foregoing in principle, is the use of baryta to take up oxygen at one temperature from the air, and to give it out again at another. This differs in principle from the foregoing methods, in that it is not a case of simple solution for the time being, but of chemical combination.

Boussingault was the first to propose the use of peroxide of barium to obtain oxygen from common air, as published in the *Annales de Chimie*, in the year 1852, series 3, Vol. XXXV., page 6. He says, according to my translation:—"It is known that on passing a current of oxygen over fragments of baryta placed in a tube heated to low redness, the gas is completely absorbed; so completely that its appearance at the mouth of the tube does not take place until the alkaline earth is entirely superoxidised; if, when the binoxide is formed, the temperature is raised to cherry red, decomposition takes place, so to say, instantaneously, and in operating upon one kilogramme of matter, about seventy-three litres of oxygen gas are obtained. After the rapid decomposition of the binoxide, the baryta resumes its original appearance and its initial properties. I have thought that it may be oxidised afresh, then made to give out the oxygen and to be reoxidised again, and so on indefinitely by the successive application of variations of heat. This property which baryta possesses of being oxidised and deoxidised within sufficiently narrow limits of temperature, I have utilised to isolate first and to collect afterwards the oxygen of the atmosphere, after having previously proved that this earth can be oxidised with facility by a current of air." Then follow several pages of experiments and figures on the obtaining of oxygen from the air on the principle stated. In subsequent years Boussingault published some more articles on the subject, one of them setting forth that the plan can be worked at or near one particular temperature, by allowing the oxygen to be absorbed at the normal pressure of the air, then drawing it out under the action of a vacuum.

A promising principle like this was not long in being taken up by inventors and practical men, for the purpose of turning it to commercial account. Several English patents in relation thereto have been taken out by various persons; some modifications and improvements were introduced into the method, including those connected with Brin's method of manufacture, which is so well known and has been so fully described in various journals, that it does not seem necessary to say more about it here.

——:o:——

An Operator's Lot is Not (always) a Happy One.

By R. U. Y. Y.

A FRIEND of mine had a recent engagement to conduct the lantern at an entertainment given by,——at the schoolrooms in connection with ——Church, and I, having finished my day's work, went with him to the place of entertainment. My business being far removed from lantern work, to wit a shorthand reporter, I thought I would leave my friend in peace to rig up his apparatus; so took a seat in the far end of the room. In a short time the superintendent of the school, who was to take the chair, came in with a smiling countenance, and washing his hands with invisible soap and imperceptible water, walked over to the lantern. My friend had previously told me of the great annoyance he had often experienced by persons interrupting him when he had little time to spare. As it was necessary to rig things up in a certain given time, I, thinking he would not relish the visit from the superindendent, took out my note book, and for the fun of the thing, thought I would make a few notes of the conversation, of which the following is a copy:

Superintendent. Ah, good evening, sir, are you, eh—the—the lantern man?

Operator. Yes, sir.

Supt. Yes, yes, to be sure—I thought you were, seeing that you were arranging matters. (Operator proceeds with his work.) Now that is what I call a very pretty-looking lantern. Let's see, that is what you call an effect-lantern; is it not?

Opr. Well, this is generally called a triple lantern.

Supt. Yes, I suppose that will be the correct name, as it has, I see, three lenses. By-the-bye, what focus of lenses do you use; for, I presume, that the focus of all should be somewhere about the same. The lens, I suppose, ends about here? (Pointing.)

Opr. It gives a much better effect if the lenses are the same focus; the focus which is generally used is reckoned in two ways, and these have an *equitorial* focus of 9 inches, whereas if they are calculated with *heat rays* they would be about twice that, but it is necessary to adjust them so that we can strike a *mean*.

Supt. Ah, that is very interesting to be sure. I had no idea that it was requisite to have matters so finely adjusted. Do you know, my son had a present of a telescope from a friend, and it is said to be a very good one. If you like, I will just get it, and ascertain your opinion respecting it.

Opr. I will be delighted I'm sure. (Exit to get the telescope.)

Opr. (to friend). This is what I call a blooming nuisance.

Friend. Do you know I am writing your conversation down.

Opr. What for?

Friend. Oh, just for fun.

Opr. Well you keep it up, and I will get you to send it to a paper of which I know the editor. (Enter the telescope.)

Supr. This is the telescope that I was telling you about. You may, perhaps, judge from the outside too quickly, but just take out the lenses and see if they are not excellent.

Opr. Very nice of its kind, and a good thing to use as a single opera-glass. (2/3 retail price.)

Supr. Ah, I'm afraid, sir, you know more about lanterns than you do about telescopes. You know that well-known saying, about every man to his trade, &c.

Opr. Well, if you will kindly excuse me I must proceed to fix up the lantern, or things will not be ready in time.

(A lull of a few minutes, during which time the apparatus is being got further ready.)

Supr. Why do you leave the gas burning when the lantern entertainment is not yet ready to commence?

Opr. It won't be ready either until I have got it adjusted with regard to the screen.

Supr. Now that is a very interesting occupation. How do you do it?

Opr. I have now done it. It is done by equalising the *mean* focus of the lenses about which you asked me a short time ago.

Supr. There must be some peculiar chemical combination which takes place when you blow the flame on the—eh—eh Yes,—thank you—the lime, by which it is rendered so intensely luminous. Might it not be possible that the lime being in such close proximity to the light may have a tendency to absorb certain of the light rays as it undoubtedly does those of heat?

Opr. Oh, yes, certainly, the limes after they have been used a certain number of times can be ground up and used as *luminous paint*, so you see that although the limes cost us three shillings a dozen they will fetch nearly twice that after they have been used some time.

Supr. Now that also is a matter of great interest, and I am glad I happened to come in early. You know one can always learn something even from the most humble person.

Opr. Sir, I beg your pardon.

Supr. Now, you must not take it in a personal light, I assure you; far be it from me any such intention. Now, sir, can I assist you?

Opr. No, thanks; and in fact I must hurry up. Excuse me, you are standing on the oxygen tube.

Supr. Oh, I beg your pardon. Is that what made the light go down so quickly? Seeing you mentioned oxygen, how do you manage to get a supply of it?

Opr. I make it from chlorate of potash, and let in run into that cylinder until it is full.

Supr. Make it out of ordinary potage, do you? But, then, by what means do you find out that it is full?

Opr. By the sides bulging out. No—no, don't touch it—or it may explode! Accidents frequently happen that way, and the whole thing might blow up!

Supr. I suppose you have had a good deal of experience with the various ramifications of——

Opr. If you will kindly excuse me you are somewhat hindering me in my work.

Supr. Allow me to send you some one to assist you.

Opr. No, thank you, I am responsible for the apparatus, and I never allow any one to meddle with it."

Interval of one hour and a-half, during which time the lecture takes place, after which the chairman (superintendent) got up to propose a vote of thanks to the lecturer, etc., and in the course of his remarks said "coming to the lantern itself it is a wonderful instrument, the lenses have to be of a particular focus, which focus is determined by striking a mean between that obtained by the equitorial and heat rays, and that "the substance of light is effected in a chemical way, so that by the absorption of the light it could afterwards be ground up, and used as luminous paint. The operation of filling the gas cylinder was (he explained) an interesting one, it being made from pot—, pot—."

At this stage a gentlemen from the front row rose, and walking up to the speaker, whispered something in his ear, whereupon the chairman coloured deeply, and concluded with a few words of thanks to the lecturer.

The operator, needless to say, made tracks, and quickly got himself and apparatus outside. Unless I am very much mistaken, he will not again be asked to operate the lantern at—— schoolrooms, especially if the same chairman has anything to do with it.

The Cause and Remedy for the Breaking of Condensing Lenses in Optical Lanterns.

By Geo. Breck.

On account of the difference in the thickness of the plano-convex lenses, commonly called condensing lenses, that are used next to the radiant or light in optical lanterns, there is a difference in the rate of heating and cooling of the thin and the thick portions of the glass. As the rate of expansion and contraction is proportional to the heating and cooling, it follows that a change in the size of one part of the lens, without a corresponding change in the whole, will produce a strain upon the glass, which will cause it to crack if the strain becomes greater than the strength of the glass will bear.

To lessen the danger from this source it is necessary to heat the lenses gradually and uniformly.

Another important point is to burn the lime jets noiselessly; that is the way they are made to be and should be operated. If it is not possible to obtain sufficient light by that method, and it is desirable to burn more gas, a jet with a larger "tip" should be procured, and then it will be possible to burn a larger amount of gas without having the jets "roaring," and, in consequence, reflecting an excess of heat from the outer edges of the flames on to the condensing lenses.

Another and a needless cause of breaking condensers is the excess of hydrogen so commonly used. The escaping hydrogen carries off much heat, thus making the lantern unnecessarily hot, beside wasting the hydrogen and causing the tanks or bags to run down unevenly; in addition to this the light is not so good.

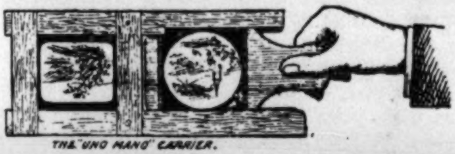
Condensing lenses should be mounted in some metal that will expand at the same rate as the glasses, or be held in springs to accomplish the same purpose.—*Pacific Coast Photographer*.

——:o:——

New Apparatus.

"UNO MANO" LANTERN CARRIER.

This carrier, of which we give a cut, will commend itself as a pleasing change from the to and fro carrier. It is manufactured by Mr. Tomkinson, 81, Dale Street, Liverpool, from whom we have received one. The extreme length of this carrier is 10½ inches, and it is strongly and neatly made. It is first placed in the lantern in the usual way, a slide inserted and the runner pushed in, this causes the slide to be sent into its proper position, and by withdrawing the runner it is gradually uncovered to view. A second slide is then inserted in the carrier, and is pushed in, and in so doing the first slide is veiled over with a slip of translucent celluloid, and on this being withdrawn it carries back with it the slide previously shown on the screen, and at the same time uncovers the second slide, which immediately springs backwards to the focal plane. The movement can be made as quickly as one pleases, and in every case the slide just exhibited is brought back to the same side of the lantern, as it was previously inserted.



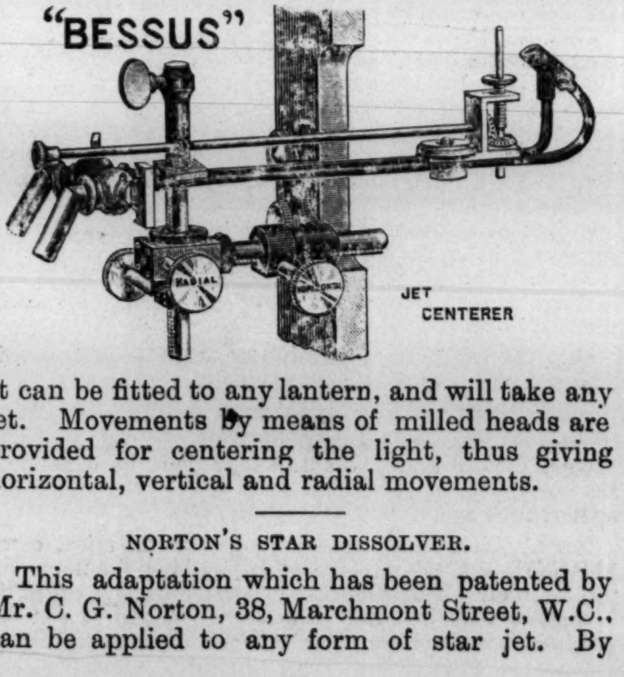
THE "UNO MANO" CARRIER.

"SLIDINKO."

"Slidinko" is a particular kind of ink for use in making diagrams for the lantern. It takes readily to clear glass, and is used with a fine pointed pen. The lines thus drawn are of dense black, and are slightly raised. This ink is put up by Messrs. Philip & Son, 32, Fleet Street, E.C.

"BESSUS" JET CENTERER.

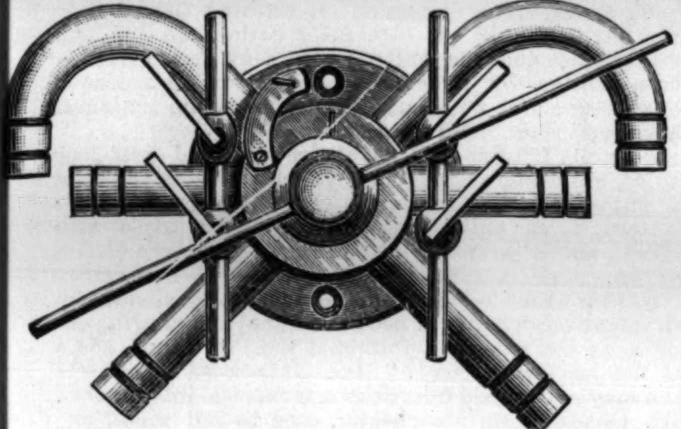
Amongst the many novelties introduced by Messrs. Airs & Co., 152, Farringdon Road, W.C., not the least interesting is their jet centerer.



It can be fitted to any lantern, and will take any jet. Movements by means of milled heads are provided for centering the light, thus giving horizontal, vertical and radial movements.

NORTON'S STAR DISSOLVER.

This adaptation which has been patented by Mr. C. G. Norton, 38, Marchmont Street, W.C., can be applied to any form of star jet. By lifting the lever shown at top of cut, the plug is capable of being turned so as to shut off both



lanterns, whilst, when the lever is down, it acts in the ordinary manner.

LANTERN ACCESSORIES.

What a fertile brain the practical man of Messrs. Butcher & Son, of Blackheath, must have. Hardly a week passes but they have something new in the lantern line to put upon the market. The latest consist of a bent and screwed tube (Fig. I) for a household gas attachment for tubing when using blow-through jet. Fig. II. represents a registering screw, which is fastened into the lower part of a slide carrier.

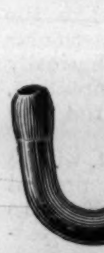


Fig. I.

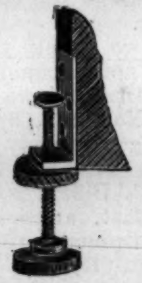


Fig. II.

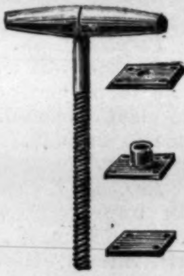


Fig. III.

On Fig. III. are tilting screws, which should be fitted to all lanterns as a ready means for tilting with ease.

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Editorial Table.

PHOTOGRAM FOLIO.—We have received from the publishers of *The Photogram* (Farringdon-avenue, E.C.), a particularly neat folio for holding the supplements contained in *The Photogram*.

ANTHONY'S INTERNATIONAL ANNUAL (1895).—From the English publishers, Messrs. Percy Lund and Co., the above is to hand. It contains good practical articles, written by some 125 writers, and is embellished with several fine illustrations in aristotype, platinum, and half tone. The price is 2s.

BRITISH JOURNAL ALMANAC.—London: Henry Greenwood and Co., 2, York-street, Covent Garden, W.C. This Annual, as usual, is a bulky volume; including the numerous advertisements, the pages total to 1,344. During the past thirty years, and commencing in a very small size, this annual has grown step by step under the editorial care of Mr. J. Traill Taylor, until it is now the ponderous volume that it is. A sound treatise is given on stereoscopic photography by the Editor, followed by a host of good articles by recognised writers on photographic and kindred subjects, and a number of illustrations are dispersed throughout the book.

ELLIMAN'S SLIDES.—From Messrs. G. Elliman, Sons and Co., Slough, of Embrocation fame, we have received a coloured set of lantern slides, taken from their advertisement posters. The slides possess an interest not only as advertisements but as illustrative of horse-racing, coaching, and similar subjects, and are got up in an attractive manner. A few words of advertisement appear on each slide, but this is done in an unobtrusive manner. We learn from an advertisement on another page that this set of nine slides will be sent free to anyone in the country willing to exhibit them on the screen at an entertainment. Particulars respecting which will be found in the advertisement spoken of.

CATALOGUE.—Mr. J. H. Steward's (Strand) Supplementary List, which contains 32 pages, shows the art of compressing much matter into small space. In it we find in addition to electric lamps, lanterns and other apparatus, many new sets of slides, including "A trip to London," "Antwerp," a number of educational and other sets.

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Correspondence.

THE DECADENCE OF LANTERN LECTURES AND ITS CAUSE.

To the Editor.

SIR,—The letter from Mr. Taunt in your last issue is very much to the point, and I am sure every right-minded lanternist will agree with it as a whole. It is not, however, distinctly stated whether the remarks contained therein are directed against the inferior amateur, the inferior professional, or both, but towards the conclusion there is a reference to "the cheap and nasty entertainer—who cuts in with a very low price," so, perhaps, the inferior professional lecturer is more generally alluded to.

Now, committees of societies and others who make arrangements for lectures are very greatly to blame for the state of things complained of by Mr. Taunt, for in every class of subject the supply of first-class lantern lectures is, at any rate, equal to the demand, and "the cheap and nasty entertainer" not having capital enough to be able to tour as a speculation, would, if he did not receive engagements, be very quickly exterminated. Many so-called lecturers merely provide their own slides and stipulate for the provision of lantern and operator by the person engaging their services, hence the indifferent performances so justly complained of. I wonder does it ever occur to those engaging such lecturers that they are, in effect, merely hiring a set of slides, the only difference being that, instead of the slides being sent with a printed lecture by passenger train, and returned the same way, the owner brings them and takes them away, remaining and describing them during exhibition.

It may be that the lecturer possesses exclusive information on the subject, but very rarely indeed is this the case. I am aware that a slight monetary saving is thus sometimes effected, but at what cost? A first-class lecturer who not only provides his own complete apparatus, but insists upon using the same on all occasions, naturally expects, and is entitled to, a reasonable fee, for his apparatus will cost him, including slides for one lecture, well on for £200, assuming that he employs a triple lantern; besides which he has to employ a competent operator, spend considerable time preparing lecture, framing and registering slides and effects, and rehearsing, not to mention cost of maintenance of apparatus, and risk of damage, etc. I have never been able to decide whether "the cheap and nasty entertainer" does this class of lecturer more harm by underselling him, than good by affording a striking comparison—for "comparisons are odious," very, to "the cheap and nasty entertainer."

Yours truly,
G. HASTINGS PHILP.

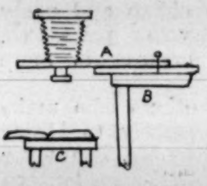
Weston Road, Gloucester.
December 10th.

ANGLING LANTERN.—COPYING PRINTED MATTER.

To the Editor.

SIR,—On the principle that "Fools rush in where angels fear to tread," may I, a desultory two-year-old at photography, tell a thing or two. First, with regard to the position of the screen and lantern. The article thereon in this (December) issue is very clear and explicit; but, suppose it is difficult or impossible to place the lantern and sheet at true right angles to each other, or that it is desirable that the lantern shall not be either amidst or behind the audience, then it may be placed at one side of the room, with the objective pointing at a slight angle *away* from the sheet, *i.e.*, turning its back upon it, and then place close against the lens at an opposing angle, a clear mirror, this will deflect the rays direct to the sheet, and, if a little care is taken to make the various angles coincide, there need be no more distortion than caused by the poor quality of the mirror, which, again, may be remedied by an optically worked mirror, tested, tried, and not found wanting.

Another wrinkle, *re* copying engravings or books: Take a stout board (A) 4 feet long by 9 inches wide, about 6 inches from one end, make a hole large enough to let the lens of the camera through; place camera upon it with lens pointing downward, fit two or four half-inch strips of wood on board to hold camera in position, nail same fast; no, put board on a table (B), and weight or fasten with camera end overhanging; a box, or chair, or stool (C) will now be placed to hold the book lying flat, and the focussing and exposure can be done in the usual manner.



Yours truly,
NOVICE.

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Notes and Queries.

U. A. writes:—"Should a half-pint of water and a quantity of black sediment be in a 20 ft. coal gas cylinder after being allowed to stand for five months?" *Ans.*—Coal gas contains moisture which condenses, and the black deposit may be a form of naphthaline. See that the cylinder is emptied out before refilling. In answer to other question we can only say, yes.

Rev. G. Beebee.—You will find Mr. Beard's address in his advertisement on the bottom of the last page but one fo this Journal.

Wick.—Messrs. Perken, Son, and Rayment sell a special wick-cutter, perhaps that will aid you in getting a true cut on the lamp wicks.

W. Fisher.—The discussion on washing sitters' faces was carried on in our columns a little more than four years ago, and the cutting you sent has evidently been written by someone who is, or was, a reader of this Journal, for we observe that some of the sentences have been reproduced word for word.

Chas. W. Winter.—We have carefully read your long letter, but cannot clearly understand what it is you want to know. Passing ordinary slides through a single lantern is as child's play to running a triple with effects, and it is in the latter that an operator's skill is shown.

B. Pine writes:—"Can you tell me what the clicking instrument was which you used as a signal for changing the slides at the recent exhibition of the Polytechnic slides at the Lantern Society?" *Ans.*—It is called a distinette and may be obtained from dealers in musical instruments. Mr. Chadwick, of Manchester, used to sell them, and may, perhaps, still. A thin strip of steel, which is provided with an indentation, is caused to bend, and this emits the click.

G. H. writes:—"What has become of the new form of lantern slides that Mr. Weeks wrote about some months ago in your Journal? Have you seen them, and can you tell me if they are a success?" *Reply.*—We have heard nothing more about it, and although Mr. Weeks promised to send us samples he has not done so, so we can only presume that he is not yet working the process.

A. J. Padgett.—Speaking in a general way of the pictures which were published forty years ago, you are quite safe.

J. K. Mackay.—1. Leave both bye-passes slightly on. Could you let us see the dissolver? 2. Even if the cylinders had no regulators the one gas would not go into the other cylinder.

Perplexed.—1. Yes, we think you would like the saturator, but we do not recommend any particular one in preference to others, as we stated emphatically in last Journal. 2. You can, by a little adaptation, use it outside. 3. A good supply of ether is the only "secret."

Rev. A. J. Roberts.—1. Black, in close contact, will be an improvement; in fact, anything that will prevent the light from going through will do. 2. Write to Mr. Stocks, High-street, Rye, who will give you particulars *re* tripod for lantern.

W. Case.—The plan you suggest will answer, if the intervening space is small; but unless you are thoroughly acquainted with the principle we should not recommend you to make an elaborate saturator. Would it not be better to purchase one of the good ones already in the market.

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MESSRS. DAWKINS & CO., Speedwell Works, Warstone Parade, Birmingham, write November 29th, 1894; "The OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER has a splendid circulation, judging from the orders we have had from our advertisements therein. Orders have even come from **NEW ZEALAND**."

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FOR want of space several interesting articles are held over.

BOUND Vols. for 1894 are now ready, 3s.; post free 3s. 4½d.